

PART II

FINAL REPORT

**FIRST STATUTORY FIVE-YEAR REVIEW of
REMEDY IMPLEMENTED for
MARSH CRUST at,
FLEET AND INDUSTRIAL SUPPLY CENTER OAKLAND
ALAMEDA FACILITY/ALAMEDA ANNEX (FISCA)
and
MARSH CRUST AND FORMER SUBTIDAL AREA at
ALAMEDA POINT
ALAMEDA, CALIFORNIA**

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EXECUTIVE SUMMARY

This report presents the results of the first statutory five-year review of the land use controls remedy that has been implemented for the marsh crust and the former subtidal area materials underlying the former Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex (FISCA) and Alameda Point, formerly known as Naval Air Station (NAS) Alameda, properties located in Alameda, California. This remedy has been described and published in the marsh crust former subtidal area Remedial Action Plan/Record of Decision (RAP/ROD) of February 2001. This decision document was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on February 2, 2001.

This five-year review report was prepared by Brown and Caldwell under subcontract with CDM Federal Programs Corporation for the Navy Multi-Media Contract N68711-00-D-0004, and conducted in accordance with the Department of the Navy (DON) and Marine Corps Policy for Conducting Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Statutory Five-Year Reviews, revised May 2004, and the U.S. EPA's Comprehensive Five-Year Review Guidance dated June 2001.

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The five-year review process for the marsh crust and former subtidal area materials involved reviews of relevant documents and data, a visual inspection of the properties overlying these materials, and interviews with persons involved with many aspects of selection and implementation of the remedy for these materials. The purpose of this five-year review was to evaluate whether the remedy that has been implemented for the marsh crust and the former subtidal area materials remained protective of human health and the environment as intended by the decision documents. The methods used in assessing the implementation and performance of the selected remedy, as well as the findings and conclusions of these evaluations are documented in this five-year review report.

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A thin, deeply buried layer of historically contaminated sediments known as the "marsh crust" and the "former subtidal area" is found underlying much of the properties once occupied by FISCA and NAS Alameda. Subsurface investigations conducted at these properties for various environmental assessments have encountered the marsh crust and the former subtidal area over a large areal extent, at depths ranging from 4 feet to 18 feet below ground surface (bgs). These materials have been buried by historical areal fill placed over them as these properties were being developed. The marsh crust and the former subtidal area are believed to exist throughout these properties in a reasonably predictable, planar zone, but may not exist as a continuous layer because of the presence of tidal channels and other phenomena affecting the original deposition.

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On the basis of environmental investigations and risk assessments, the environmental assessments conducted for these two properties have concluded that hazardous substances were present in the marsh crust materials beneath FISCA, and in the marsh crust and former subtidal area materials beneath Alameda Point. However, these substances were considered to be low-level wastes because of their low concentrations and toxicity.

In accordance with these findings and conclusions, and, in accordance with the remedial action objective (RAO), CERCLA requirements, Base Realignment and Closure (BRAC) program goals, future land use plans for FISCA and Alameda Point properties (a mixed reuse of residential, commercial, and industrial), the DON and the DTSC, with the concurrence of the

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California Regional Water Quality Control Board (CRWQCB), chose land use controls (LUCs) as the selected remedy for the marsh crust and former subtidal area materials underlying these properties.

The selected remedy documented in the RAP/ROD prohibits excavations into the marsh crust and former subtidal area materials unless proper precautions are first taken to protect the health and safety of residents and workers, as well as the environment, and to ensure that excavated materials are disposed of properly. These land use controls, consisting of excavation restrictions and permitting requirements, are implemented through land use covenants between DTSC and the City of Alameda; Environmental Restrictions in Deed imposed by the DON; a Lease in Furtherance of Conveyance between DON and the Alameda Reuse and Redevelopment Authority (ARRA); and the City of Alameda Marsh Crust Excavation Ordinance No. 2824, in a manner that would provide overall protection of human health and the environment.

Based on the findings of this five-year review, the land use controls remedy for the marsh crust and the former subtidal area materials has been implemented as intended by the decision documents, and the remedy as currently implemented continues to meet the remedial action objectives (RAOs), and appears to continue to provide the means for adequately restricting the potential exposure of residents, workers, and the environment to these materials.

The land use controls remedy implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties appears to be currently providing the protectiveness of human health and the environment intended by the decision documents. Exposure of residents, workers and the environment to these materials have been restricted suitably by this remedy, addressing potential threats to human health and the environment possibly posed by these materials. Land use controls in effect clearly identify the permitting requirements and restrictions related to excavations into the marsh crust and the former subtidal area materials. The Catellus Development Corporation's Site Management Plan (SMP) for the redevelopment of portions of these properties provides guidelines for excavations and construction activities in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment.

Technical or physical issues related to the marsh crust and the former subtidal area materials that would be likely to reverse the current conditions and implemented remedy were not discovered in this five-year review.

The FISCA and Alameda Point properties overlying the marsh crust and former subtidal materials are being redeveloped in accordance with decision documents and redevelopment plans under the oversight of regulatory agencies. The actual, long-term land use conditions of the properties overlying the marsh crust and the former subtidal area materials can significantly increase over the next five years. Similarly, increased land use by new residents and workers is also to be expected. Also, future investigations and assessments could provide additional information on the threshold depths of the marsh crust and the former subtidal area materials currently depicted in land use covenants.

On the basis of the observations and findings of this five-year review, unless new information related to human health and environmental risks as currently understood to be potentially posed

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Executive Summary

by the marsh crust and the former subtidal area materials is identified that would no longer require restricting exposure of residents, workers or the environment to these materials, conducting the next five-year review of the land use controls remedy currently in effect for the marsh crust and the former subtidal area materials, including an assessment of the effectiveness and protectiveness of this remedy, is recommended.

As such, the next Statutory Five-Year Review of the land use controls remedy currently in effect for the marsh crust and the former subtidal area materials underlying the FISCA and Alameda Point properties needs to be completed within the next five years, or before July 2011.

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The decision document (RAP/ROD) for the marsh crust and former subtidal area materials required a Land Use Control Implementation and Certification Plan (LUCICP). The DON has generally agreed with environmental regulators that land use controls depend heavily upon long-term follow through, oversight, and enforcement to ensure their reliability and effectiveness. The DON has planned to accomplish oversight and long-term monitoring of the land use controls remedy implemented for the marsh crust and former subtidal area materials through the preparation of a Land Use Control Remedial Design (LUC RD) for FISCA and Alameda Point in Fiscal Year (FY) 2006. The LUC RD will develop protocols for the enforcement and monitoring of land use controls implemented for the marsh crust and former subtidal area materials underlying FISCA and Alameda Point.

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TABLE OF CONTENTS

Section	Page
EXECUTIVE SUMMARY	ES-1
ACRONYMS AND ABBREVIATIONS	Acronyms - 1
FIVE-YEAR REVIEW SUMMARY FORM.....	SF-1
1 INTRODUCTION	
2 CHRONOLOGY OF SITE EVENTS	
3 SITE BACKGROUND	
3.1 Physical Setting.....	3-1
3.2 Land and Resource Use.....	3-2
3.3 History of Contamination	3-3
3.4 Initial Response.....	3-3
3.5 Basis for Taking Action.....	3-4
4 REMEDIAL ACTIONS	
4.1 Selected Remedy.....	4-1
4.2 Remedy Implementation.....	4-2
5 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW	
6 FIVE-YEAR REVIEW PROCESS AND FINDINGS	
6.1 Five-Year Review Administrative Components.....	6-1
6.2 Community Involvement	6-1
6.3 Document and Data Review	6-2
6.4 Site Visit and Inspection	6-3
6.5 Interviews.....	6-4
7 TECHNICAL ASSESSMENT	
7.1 Question A: Is the remedy functioning as intended by the decision documents?	7-1
7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid? ...	7-2
7.3 Question C: Has any other information come to light that could call into	

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Table of Contents

question the protectiveness of the remedy?	7-3
7.4 Technical Assessment Summary	7-3
8 ISSUES, CONCLUSIONS, RECOMMENDATIONS	
9 PROTECTIVENESS STATEMENT	
10 NEXT FIVE-YEAR REVIEW	

FIGURES

FIGURE

- 1 Site Location Map (adapted from the Marsh Crust and Former Subtidal Area Record of Decision dated February 2001)
- 2 Threshold Depth Flow (below ground surface) below which an excavation permit is required (excerpted from the City of Alameda Marsh Crust Excavation Ordinance No. 2824, dated February 2000)

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ATTACHMENTS

ATTACHMENT

- A Listing of Marsh Crust and Former Subtidal Area Materials Related Documents Included In This First Five-Year Review
- B Site Inspection Form, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- C Site Photographs Taken During Site Inspection on May 10, 2005 and Aerial Photograph of FISCA and Alameda Point Overlying the Marsh Crust and the Former Subtidal Area dated October 2004, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- D Interview Documentation Form, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- E Interview Records, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- F Applicable or Relevant and Appropriate Requirements (ARARs) Analysis Review, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy

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Table of Contents,

- G Copies of “Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for East Housing Portion of NAS Alameda” between the Department of the Navy and the Alameda Reuse and Redevelopment Authority, dated July 17, 2000, recorded on July 20, 2000; “Covenant to Restrict Use of Property (Environmental Restriction), Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex, and Alameda Naval Air Station East Housing, Alameda, California” between the City of Alameda or Alameda Reuse and Redevelopment Authority and the California Environmental Protection Agency, Department of Toxic Substances Control, dated July 17, 2000, recorded on July 20, 2000; and, “City of Alameda Marsh Crust Excavation Ordinance No. 2824” dated March 8, 2000.
- H Copies of Bayport Development Grant Deeds with Environmental Deed Restrictions

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ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
ARRA	Alameda Reuse and Redevelopment Authority
B(a)P	benzo(a)pyrene
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
COC	chemical of concern
DON	Department of the Navy
DTSC	California Environmental Protection Agency, Department of Toxic Substances Control
EDC	<u>Economic Development Conveyance</u>
ELCR	excess lifetime cancer risk
ERA	ecological risk assessment
FISCA	Fleet and Industrial Supply Center Oakland, <u>Alameda Facility/Alameda Annex</u>
FOSET	<u>Finding of Suitability for Early Transfer</u>
FS	feasibility study
HHRA	human health risk assessment
HSAA	Hazardous Substances Account Act
HSC	Health and Safety Code
IR	Installation Restoration (Program)
LIFOC	<u>Lease in Furtherance of Conveyance</u>
LUC	Land use control
LUCICP	Land Use Control Implementation and Certification Plan
LUC RD	Land Use Control Remedial Design
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NSC	Naval Supply Center
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PBC	<u>Public Benefit Conveyance</u>
PP	<u>Proposed Plan</u>
PRG	<u>Preliminary Remediation Goal</u>
RAB	Restoration Advisory Board
RAO	remedial action objective
RAP	remedial action plan

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Acronyms/Abbreviations

RD	Remedial design
RI	remedial investigation
ROD	Record of decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendment and Reauthorization Act
SI	Site Investigation
SMP	Site Management Plan
SVOC	semivolatile organic compound
USEPA	United States Environmental Protection Agency

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First Five-Year Review Summary Form

**SUMMARY FORM
FIRST STATUTORY FIVE-YEAR REVIEW
MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS REMEDY**

SITE IDENTIFICATION		
Site Name: Marsh Crust, Fleet and Industrial Supply Center Oakland, FISCA; and, Marsh Crust and Former Subtidal Area, Alameda Point		
EPA ID: 2170023236		
Region: IX	State: CA	City/County: Alameda / Alameda
SITE STATUS		
NPL Status: <input type="checkbox"/> Final <input type="checkbox"/> Deleted <input checked="" type="checkbox"/> Other (specify) FISCA is not on the National Priorities List. Alameda Point was listed on the NPL in 1999 – however, the NPL listing does not include the subsurface soil contamination layer known as the marsh crust and the former subtidal area.		
Remediation Status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Remediation Completion Date: Marsh Crust Ordinance No. 2824 was enacted on February 15, 2000; a Covenant to Restrict Use of Property was signed on July 17, 2000; Navy placed Environmental Restrictions in the Deed when it transferred title on July 20, 2000.	
Has site been put into reuse? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Portions of these facilities have been redeveloped and/or reused. Other portions are expected to be redeveloped over the next several years.		
REVIEW STATUS		
Lead agency: <input type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input checked="" type="checkbox"/> Other Federal Agency : Department of the Navy		
Author name: Southwest Division Naval Facilities Engineering Command (SWDIV)		
Author title:	Author affiliation:	
Review period: 05 / 09 / 2005 to 07 / 01 / 2006		
Date(s) of site inspection: 05 / 09 / 2005 to 05 / 12 / 2005		
Type of review:	<input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input checked="" type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion	
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input type="checkbox"/> Previous Five-Year Review Report <input checked="" type="checkbox"/> Other (specify): Signing of the Record of Decision, February 02, 2001		
Triggering action date: 02 / 02 / 2001 – Non-Construction Remedy – Trigger is ROD Signing Date		
Due date (five years after triggering action date): 02 / 02 / 2006		

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* "OU" refers to operable unit.

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First Five-Year Review Summary Form

SUMMARY FORM (continued)
FIRST STATUTORY FIVE-YEAR REVIEW
MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS REMEDY

Issues, Recommendations and Follow-up Actions:

FISCA and Alameda Point properties overlying the marsh crust and the former subtidal area materials are being redeveloped in accordance with decision documents and redevelopment plans under the oversight of regulatory agencies. As redevelopment progresses, increased construction activities involving excavations potentially extending to the depths where these materials can be encountered, can reasonably be expected. Further, increased land use by new residents and workers is also to be expected. Also, future investigations and assessments could provide additional information on the threshold depths of the marsh crust and the former subtidal area materials currently depicted in land use covenants. On the basis of the observations and findings of this five-year review, unless new information related to human health and environmental risks as currently understood to be potentially posed by the marsh crust and the former subtidal area materials is identified that would no longer require restricting exposure of residents, workers or the environment to these materials, conducting further five-year reviews of the land use controls remedy currently in effect for the marsh crust and the former subtidal area materials is recommended, and it is required by the NCP,

As such, the next Statutory Five-Year Review of the land use controls remedy currently in effect for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties needs to, be completed within the next five years, or before July, 2011.

The DON intends to prepare a Land Use Controls Remedial Design (LUC RD) for the marsh crust and former subtidal area materials in FY 2006. The LUC RD will develop protocols for the enforcement and monitoring of the land use controls remedy implemented for these materials.

Protectiveness Statement:

The land use controls remedy implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties currently provides the protectiveness of human health and the environment intended by the decision documents. Exposure of residents, workers and the environment to these materials have been restricted suitably by this remedy, addressing potential threats to human health and the environment possibly posed by these materials. Land use controls in effect clearly identify the permitting requirements and restrictions related to excavations into the marsh crust and the former subtidal area materials. The Catellus Development Corporation's Site Management Plan for the redevelopment of these properties provides guidelines for excavations and construction activities in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Technical or physical issues related to the marsh crust and the former subtidal area materials that would be likely to reverse the current conditions and the implemented remedy were not discovered in this five-year review.

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Section 1 INTRODUCTION

This report presents the results of the first statutory five-year review of land use controls remedy selected and implemented for the marsh crust and the former subtidal area materials underlying Fleet and Industrial Supply Center Oakland, Alameda facility/Alameda Annex (FISCA) and Alameda Point (the former Naval Air Station (NAS) Alameda), Alameda, California. This remedy has been described and published in the marsh crust former subtidal area Remedial Action Plan/Record of Decision (RAP/ROD) dated February 2001. This decision document was approved by the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on February 2, 2001. Figure 1 illustrates the locations of FISCA and Alameda Point.

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The purpose of five-year reviews is to evaluate whether a remedy that has been implemented at a site remains protective of human health and the environment at that site. The methods used in assessing the implementation and performance of the selected remedy, as well as the findings and conclusions of these evaluations are documented in five-year review reports.

A five-year review report provides a clear statement as to whether the selected remedy is being protective, or if it is expected to become protective sometime in the future. In the event a five-year review finds deficiencies to exist in remedy implementation or in the performance of the remedy itself which could lead to non-protectiveness of human health and the environment, the five-year review report would identify such issues, and provide recommendations as to how these issues can be resolved. Similarly, if the five-year review finds that assumptions, regulatory requirements and/or analytical methods used to establish cleanup goals for the chemicals of concern at the time of selecting and implementing the remedy have changed during the five years covered by the review, which could lead to non-protectiveness of human health and the environment, then the five-year review would identify such changes and provide recommendations as to how to address such issues. As such, the five-year review report would contain recommendations of specific actions that would provide the means for the remedy to become or to continue being protective.

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Five-year reviews are required by statute in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (Title 42 *United States Code* 9601), commonly referred to as the "Superfund," as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. CERCLA §121(c), as amended, states:

"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."

Additionally, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 *Code of Federal Regulations* [CFR] §300.430(f)(4)(ii) states:

"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use

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Section 1 Introduction

and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

The Department of the Navy (DON) has interpreted these regulations as requirements for a five-year review when hazardous substances, pollutants, or contaminants remain at a site above levels that would allow for unlimited use and unrestricted exposure, and, if the RAP/ROD for the site was signed on or after October 17, 1986, when SARA was promulgated. The DON defines 'unlimited use' and 'unrestricted exposure' to mean no restrictions placed on the use of a site.

As such, the DON has undertaken the preparation of this statutory five-year review of the land use controls remedy which has been selected and implemented for the subsurface soil contamination layer known as the marsh crust and the former subtidal area materials underlying, FISCA and Alameda Point. This remedy restricts excavating and handling of the marsh crust and the former subtidal area materials. CERCLA requires five-year reviews of remedies that include land use restrictions. Additionally, the RAP/ROD for the marsh crust and the former subtidal area materials was signed in February 2001, after promulgation of SARA.

This is the first five-year review of the remedy implemented for the marsh crust and the former subtidal area materials. The triggering action for this review was the signing of the marsh crust and the former subtidal area RAP/ROD in February 2001. This five-year review was conducted by the DON between May 2005 and July 2006.

This five-year review report is divided into ten sections and seven attachments, as described below.

- Section 1 - an introduction into five-year reviews in general, and to this five-year review in particular.
- Section 2 - a chronology of events related to marsh crust and former subtidal area materials evaluations and remedy selection.
- Section 3- marsh crust and former subtidal area materials background information, including physical setting, land and resource use, history of contamination, initial response, and the basis for taking remedial action.
- Section 4- remedy selected and implemented for the marsh crust and former subtidal area materials.
- Section 5 - progress made since the last five-year review.
- Section 6- typical activities performed as part of a five-year review process, and the findings of this five-year review, including community involvement, the results of document and data review, site inspection, and interviews.
- Section 7 - technical assessment of the remedy implemented for the marsh crust and, former subtidal area materials.
- Section 8 - issues identified, as well as conclusions, and recommendations as to how the issues can be resolved.
- Section 9- protectiveness statement for the remedy implemented for the marsh crust and former subtidal area materials.

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Section 1 Introduction

Section 10 - discussion of the next five-year review.

The following attachments are appended in support of and for completeness of this five-year review:

Attachments

- A Listing of Marsh Crust and Former Subtidal Area Materials Related Documents Included In This First Five-Year Review
- B Site Inspection Form, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- C Site Photographs Taken During Site Inspection on May 10, 2005 and Aerial Photograph of FISCA and Alameda Point Overlying the Marsh Crust and the Former Subtidal Area dated October 2004, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- D Interview Documentation Form, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- E Interview Records, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- F Applicable or Relevant and Appropriate Requirements (ARARs) Analysis Review, First Five-Year Review, Marsh Crust and Former Subtidal Area Materials Remedy
- G Copies of "Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for East Housing Portion of NAS Alameda" between the Department of the Navy and the Alameda Reuse and Redevelopment Authority, dated July 17, 2000, recorded on July 20, 2000; "Covenant to Restrict Use of Property (Environmental Restriction), Fleet and Industrial Supply Center Oakland, Alameda Facility/Alameda Annex, and Alameda Naval Air Station East Housing, Alameda, California" between the City of Alameda or Alameda Reuse and Redevelopment Authority and the California Environmental Protection Agency, Department of Toxic Substances Control, dated July 17, 2000, recorded on July 20, 2000; and, "City of Alameda Marsh Crust Excavation Ordinance No. 2824" dated March 8, 2000.
- H Copies of Bayport Development Grant Deeds with Environmental Deed Restrictions

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B – Marsh Crust and Former Subtidal Area First Five-Year Review Site Inspection Form
C – Photographs and Aerial Photograph of Areas Overlying the Marsh Crust and the Former Subtidal Area Taken During Site Inspection on May 10, 2005 and dated October 2004, Respectively
D – Marsh Crust and Former Subtidal Area First Five-Year Review Interview Documentation Form
E – Marsh Crust and Former Subtidal Area First Five-Year Review Interview Records
F – Marsh Crust and Former Subtidal Area First Five-Year Review Applicable or Relevant and Appropriate Requirements (ARARs) Analysis Review

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Section 1 Introduction

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Section 2 CHRONOLOGY OF SITE EVENTS

Important and relevant information on environmental investigation, remedial planning, remedial action events and the dates of these events related to the marsh crust and former subtidal area materials are listed below in chronological order. These events typically include site assessment, preparation of decision documents, and remedial actions.

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CHRONOLOGY OF EVENTS

MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS

Event	Date
The properties occupied by FISCAs, Alameda Point, and surrounding area exists as undeveloped marshlands and tidal flats along the fringe of San Francisco Bay.	Prior to 1920's
The marshlands are covered with imported fill comprising sands and clays of unknown origin.	1920's - 1930's
The developed Alameda Facility area is used as a commercial airport.	1920's - 1940's
The Army acquires the western tip of Alameda Island from the City of Alameda and begins construction.	1930
The Navy acquires title to the land from the Army and begins building Naval Air Station (NAS), Alameda in response to the military buildup in Europe before World War II. This construction involves filling the natural tidelands, marshes, and sloughs between the Oakland Inner Harbor and the western tip of Alameda Island.	1936
The Navy acquires more land west of the installation after the U.S. enters World War II.	1941
US Government purchases the Alameda Facility property for use as a depot.	1941 (Alameda Facility) and 1966 (Alameda Annex)
After the end of World War II, the NAS Alameda continued its primary mission of providing facilities and support for fleet aviation activities. While it operated as an active naval base, the installation provided berthing for Pacific Fleet ships and was a major center of naval aviation.	1945
Command of Alameda Facility property transferred to Naval Supply Center (NSC) Oakland.	1964
Alameda Annex property transferred to NSC Oakland.	1980
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as 'Superfund' is promulgated.	1980
Department of the Navy (DON) begins investigating sites under its Installation Restoration (IR) Program.	1980's
Superfund Amendments and Reauthorization Act (SARA) amends CERCLA.	1986
A Site Investigation (SI) is conducted for Alameda Annex.	1987
A Preliminary Assessment (PA) is conducted for Alameda Annex.	1988
NAS Alameda is identified for closure under Base Realignment and Closure (BRAC).	1993
Final Remedial Investigation (RI) report for FISCAs is issued. Soil samples were collected during the RI from the marsh crust in and around Site IR02.	January 1996
NAS Alameda issues a History & Geology Fact Sheet.	June 1996

Section 2 Chronology of Site Events

CHRONOLOGY OF EVENTS
MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS

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Event	Date
NAS Alameda ceases all naval operations, in preparation for returning the land to the City of Alameda.	April 30, 1997
FISCA is closed under the BRAC Act of 1990.	September 30, 1998
Draft Finding of Suitability for Early Transfer (FOSET) of FISCA to the City of Alameda is issued. The FOSET states that the property transfer will include several interim measures to prevent unacceptable exposure to risks identified for the property, including requiring contractors excavating marsh crust soils to prepare soil management plans which describe how excavated soils will be stored, tested, and disposed of.	December 1999
Remedial Investigation (RI) Reports are issued for Alameda Point OU-1, OU-2 and OU-3, which overlie the marsh crust and the former subtidal area.	1999
The City of Alameda issues its Marsh Crust Excavation Ordinance 2824, providing standards and procedures to be followed regarding excavation and pile driving in the marsh crust area.	February 15, 2000
Final feasibility study (FS) report for the 'Marsh Crust at Alameda Annex and Alameda Point' is issued.	March 31, 2000
DTSC prepares a Removal Action Workplan for Marsh Crust at East Housing.	May 2000
DON issues its Proposed Plan (PP) for the marsh crust at 'Alameda Annex and Alameda Point'. The Navy states in the PP that its preferred remedial alternative is Land Use Controls that would require that proper procedures are followed to excavate soil that would reach the underlying marsh crust and former subtidal area. The PP also states that the DON would conduct a review after 5 years of implementing this remedy to ensure compliance with the land use controls, as required by CERCLA; and, that the land underlain by the marsh crust and the former subtidal area could be available for residential or industrial use after this remedy is implemented.	June 2000
The DON and the Alameda Reuse and Redevelopment Authority (ARRA) enter into a 'Lease in Furtherance of Conveyance (LIFOC) for Former Naval Air Station Alameda.' The LIFOC addresses Economic Development Conveyance (EDC) parcels, Public Benefit Conveyance (PBC) parcels, federal (FED) parcels, and three non-EDC, -PBC, or -FED parcels. Potential digging restrictions subject to negotiation with the ARRA, institutional controls, and/or land use restrictions are placed on most of the parcels.	June 06, 2000
The DON and the City of Alameda execute a 'Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for FISC Alameda' wherein the DON transfers FISCA to the City of Alameda with environmental restrictions placed on the use of the property. The City of Alameda agrees that it will comply with the City of Alameda Ordinance No. 2824 regarding excavation into the marsh crust and subtidal zone at the former NAS Alameda, the Alameda Facility, and the Alameda Annex.	July 17, 2000
The DON and the ARRA execute a 'Quitclaim Deed and Environmental Restrictions Pursuant to California Civil Code Section 1471 for East Housing Portion of NAS Alameda,' wherein the DON transfers NAS Alameda property to the ARRA with environmental restrictions placed on the use of the property. The ARRA agrees that it will comply with the City of Alameda Ordinance No. 2824 regarding excavation into the marsh crust and subtidal zone at the former NAS Alameda, the Alameda Facility, and the Alameda Annex.	July 17, 2000

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Section 2 Chronology of Site Events

CHRONOLOGY OF EVENTS
MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS

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Event	Date
The ARRA and the DTSC execute a 'Covenant to Restrict Use of Property (Environmental Restrictions), Fleet and Industrial Supply Center Oakland, Alameda Facility and Alameda Annex, and Alameda Naval Air Station East Housing, Alameda, California.' Use of the property is restricted to protect human health and the environment. Covenant requires that its restrictions be incorporated into each and all deeds, leases, and subleases of any portion of the property.	July 17, 2000
The DON issues its Quarterly Report for Alameda Facility and Alameda Annex. The report provides the activities completed for the property in connection with the marsh crust investigations.	September – November 2000
The DON issues its Draft Final Site Management Plan for <u>FISCA</u> , describing the marsh crust and related issues.	November 09, 2000
The DON and the State of California sign the marsh crust and former subtidal area Remedial Action Plan/Record of Decision (RAP/ROD). The RAP/ROD states that based on the results of the remedial investigations conducted, the Navy and the DTSC, with the concurrence of the USEPA and the Regional Water Quality Control Board (RWQCB), have selected land use controls for the marsh crust and the former subtidal area at <u>FISCA</u> and at Alameda Point. According to the RAP/ROD, the selected remedy addresses principal threats by restricting future use occupants from excavating into the marsh crust and deposits from the former subtidal area. Proper procedures would be required to be used to ensure that workers are not exposed and that the contaminated materials brought to the surface are properly disposed of. The RAP/ROD further states that the remedy of institutional controls consists of three tiers of land use controls: Environmental Restrictions in Deed with the City of Alameda (July 17, 2000); Covenant to Restrict Use of Property between the DTSC and the City of Alameda (July 17, 2000); and the Marsh Crust Ordinance enacted by the City of Alameda (February 15, 2000).	February 02, 2001
The USEPA issues its letter to the DON agreeing with the selection of Land Use Controls as the established remedy for marsh crust at Alameda Annex and for the marsh crust and former subtidal area at Alameda Naval Air Station.	February 13, 2001
A <u>Site Management Plan</u> (SMP) is issued by Catellus Development Corporation, the developer of <u>FISCA</u> and the Alameda Point East Housing Area. The Catellus SMP, issued under City of Alameda Ordinance No. 2824, provides guidelines and the means for redevelopment of these sites in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Ordinance No. 2824 regulates excavations into the marsh crust and handling of materials excavated from below the marsh crust threshold depths. Regulatory oversight of implementing this SMP would be provided by the DTSC and the City of Alameda.	April 23, 2002
DON issues its 'Final Site Management Plan Update for Alameda Annex'. It states that the final RAP/ROD for the marsh crust at Alameda Annex and Alameda Point was signed in February 2001, and that the remedy is Land Use Controls (LUCs) including environmental deed restrictions, a covenant to restrict use of the property and City Ordinance 2824 that requires excavation permits and soil management plans for excavations to depths beyond the threshold depths identified in the ordinance.	January 2005
First Five-Year Review	May 2005 – <u>July, 2006</u>
Site Inspection for first five-year review	May 10, 2005
Document and data review for first five-year review	May 10 – June 24, 2005

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Section 2 Chronology of Site Events

CHRONOLOGY OF EVENTS
MARSH CRUST AND FORMER SUBTIDAL AREA MATERIALS

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Event	Date
Interviews for first five-year review	May 10 – June 24, 2005
<u>Draft first five-year review report of the remedy implemented for the marsh crust and former subtidal area materials is issued for review and comments</u>	<u>August 2005</u>
<u>Final first five-year review report of the remedy implemented for the marsh crust and former subtidal area materials is issued</u>	<u>July 2006</u>

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Section 3 SITE BACKGROUND

FISCA and the former NAS Alameda are located on Alameda Island, in the City of Alameda. NAS Alameda (now Alameda Point) is located on the western end of Alameda Island, adjacent to and west of FISCA (Figure 1). NAS Alameda ceased its operations on April 30, 1997. FISCA was closed on September 30, 1998.

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This section presents marsh crust and former subtidal area materials background information, including physical setting, land and resource use, history of contamination, initial response, and the basis for taking remedial action in response to chemical compounds reported in the subsurface sediment layer known as the marsh crust and the former subtidal area underlying FISCA and Alameda Point properties at the time when the marsh crust and the former subtidal area RAP/ROD was signed. The discussions and information presented in this section include major marsh crust and former subtidal area assessment activities conducted prior to and following the signing of the marsh crust and the former subtidal area RAP/ROD with the intent of providing a basis for comparing the performance of the remedy implemented for the marsh crust and the former subtidal area materials with the conditions potentially posed by the marsh crust and the former subtidal area materials that the remedy was intended to mitigate.

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3.1 PHYSICAL SETTING

A thin, deeply buried layer of historically contaminated sediments known as the “marsh crust” and the “former subtidal area” is found within and underlying much of the FISCA and Alameda Point properties. Subsurface investigations conducted at these properties for various environmental assessments have encountered the marsh crust and the former subtidal area materials over a large areal extent, at depths ranging from 4 feet to 18 feet below ground surface (bgs). The marsh crust and the former subtidal area are believed to exist throughout these properties in a reasonably predictable, planar zone, but may not exist as a continuous layer because of the presence of tidal channels and other phenomena affecting the original deposition.

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This layer is believed to have been formed during the late 1800s to 1920s, when manufactured gas plants and an oil refinery operating near the future locations of FISCA and Alameda Point are thought to have discharged petroleum waste to adjacent marshlands. The discharge is believed to have been rich in semivolatile organic compounds, including polynuclear aromatic hydrocarbons (PAHs). The waste appears to have spread over much of the marsh surface through tidal actions, leaving a thin layer of contaminated sediment over the area that would later become FISCA and Alameda Point. Sediments dredged during improvement of the Oakland Inner Harbor and surrounding San Francisco Bay have been placed as areal fill on the marsh surface beginning 1887, encapsulating the former subtidal area and the marsh crust underneath.

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The historical areal fill that has formed the current FISCA property is present to depths ranging from about 4 feet bgs in the northern portions of the property to 20 feet bgs in its southern portions. The marsh crust, which underlies this areal fill, has been observed during various investigations as an organic-rich peat and grass layer that is about 2 to 6

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Section 3 Site Background

inches thick. Immediately below the marsh crust layer is the Bay Mud layer, which underlies the entire FISCA property.

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Alameda Point has been constructed by placing areal fill not only on the former marshlands, but also beyond the limits of the former marshlands into the subtidal area of San Francisco Bay. The areal fill has been placed from 1887 to as late as 1975. The thickness of this fill varies as a result of natural variation in the depth of the estuary before filling activities started. As such, the areal fill is thinnest at the eastern edge and thickens to about 20 feet at the western edge of Alameda Point. Underlying this fill is the marsh crust in the eastern portion and the former subtidal area in the western portion of Alameda Point. The former subtidal land is rich in organic content, and it was mapped as 'tidal flats' in an 1856 U.S. Coast and Geodetic Survey. This highly organic layer appears to be comprised of decayed organic matter incorporated into the mineral soil, typically from plant detritus (such as decayed stems and leaf skeletons or humus) and algae. The Bay Mud underlies both the marsh crust and the former subtidal land beneath Alameda Point.

3.2 LAND AND RESOURCE USE

Until the 1920s, FISCA and Alameda Point, as well as the surrounding area existed as undeveloped marshlands and tidal flats along the fringe of San Francisco Bay. Before 1930, at least two large industrial sites (an oil refinery and a borax processing plant) were located on the western tip of Alameda Island. Several industries were located on the northern side of Oakland Inner Harbor, including two manufactured gas plants. Land use has been industrial since the land was created using imported fill between 1887 and 1939.

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FISCA was zoned as a general industrial (manufacturing) district with a special government-combining overlay. The Oakland Inner Harbor, which is north of the facility, contains a ferry terminal, shipyards, several marinas and yacht clubs. The area east of the facility encompasses commercial and industrial properties. The area south of the facility consists of residential developments, including housing, elementary schools, a middle school, and the College of Alameda. The area west of the facility is occupied by Alameda Point.

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Alameda Point is currently a mixed-use area with industrial and office space; land uses at Alameda Point formerly included military operations and family housing. The Oakland Inner Harbor, north of the facility, contains a ferry terminal, shipyards, several marinas and yacht clubs. The area east of the facility encompasses FISCA. The area southeast of the facility consists of residential developments, including housing, elementary schools, a middle school, and the College of Alameda. San Francisco Bay lies to the west of the facility.

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The Oakland Inner Harbor, which is an extension of San Francisco Bay, is adjacent to the northern boundary of FISCA and Alameda Point. The shoreline of Oakland Inner Harbor is almost entirely modified by human activity, and a variety of industries are located along its entire length (including port facilities, shipbuilding and repair facilities, sand and gravel off-loading areas, and marinas).

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Section 3 Site Background

Landscaped areas around office buildings at FISCA are characterized by ornamental trees and shrubs and small grass lawns. Aquatic areas are present on the northern portion of the facility, bordering the Oakland Inner Harbor. Although harbor seals and birds, including California brown pelicans, double-crested cormorants, and several species of gulls, have been observed in the inner harbor area, these species do not nest or feed at FISCA because it offers no supporting habitat. Similarly, of the wildlife species in the San Francisco Bay Area that are classified as endangered or threatened by either the state or federal government, none nests or feeds at FISCA.

Alameda Point is almost entirely modified by human activity, and a variety of industries and activities are located through the facility (including port facilities, aircraft repair facilities, office buildings, runways, and landfills). Alameda Point, including contiguous and noncontiguous properties, such as constructed breakwaters, contains nine terrestrial and aquatic wildlife habitats. Major habitat types at Alameda Point include: open water areas; estuarine intertidal emergent wetlands; paved runway areas; non-native grassland; ruderal upland vegetation; disturbed areas; beach, urban, and ornamental landscapes; and riprap. Several special status species have been identified that occur or are expected to occur at Alameda Point.

The FISCA facility underwent base closure on September 30, 1998. The Navy transferred title to the property to the City of Alameda on July 17, 2000 pursuant to an Economic Development Conveyance conducted as an early transfer under CERCLA Section 120 (h)(3). NAS Alameda has ceased operations on April 30, 1997 and undergone base closure on September 30, 1998. It is in the process of being released for public use upon completion of closure under the BRAC of 1998 and the BRAC of 1990.

3.3 HISTORY OF CONTAMINATION

From the late 1800s until the 1920s, two gas plants and an oil refinery were located near the present locations of FISCA and Alameda Point. These facilities are believed to have discharged petroleum products and wastes and, possibly, CERCLA hazardous substances to adjacent marshlands during their operation. The discharges were probably rich in semivolatile organic compounds (SVOCs), including PAHs. The waste appears to have migrated over much of the surface of the surrounding marsh and deposited on the marsh surface through tidal actions, leaving a layer of contaminated sediment under the 143-acre area that is now FISCA and the eastern portion of the 2,675-acre area that is now Alameda Point. This layer is now known as the marsh crust. Further to the west, beneath Alameda Point, the waste has been deposited on tidal flats, now known as the former subtidal area. Sediments that have been dredged from the Oakland Inner Harbor and surrounding San Francisco Bay have been placed as areal fill on these materials from as early as 1887 to as late as 1975, encapsulating the former subtidal area and marsh crust.

3.4 INITIAL RESPONSE

The Proposed Plan (PP) identifying the preferred remedy for the marsh crust and former subtidal area materials underlying FISCA and Alameda Point was made available to the

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Section 3 Site Background

public in June 2000. The final RAP/ROD for the marsh crust and the former subtidal area was signed in February 2001, and it selected land use controls as the remedy for the marsh crust and the former subtidal area materials. In accordance with the California Environmental Quality Act, the DTSC conducted an Initial Study for the remedy selected for the marsh crust and the former subtidal area materials. A proposed Negative Declaration was also made available through the information repositories. The notice of availability of the PP, the draft RAP/ROD and the Negative Declaration was published in the Oakland Tribune and the Alameda Times on June 20, 2000. A public comment period was held from June 20 to July 20, 2000. A public meeting was held on June 29, 2000. At the meeting, representatives from the DON, DTSC, USEPA, and RWQCB answered questions about the PP and the preferred alternatives. These activities fulfilled the requirements of the Hazardous Substances Account Act (HSAA) (Health and Safety Code (HSC) Section 25356.1), CERCLA community participation requirements of Sections 113(k)(2)(B)(i-v) and 117(a)(2), and the NCP, 40 CFR Section 300.430(0)(3).

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3.5 BASIS FOR TAKING ACTION

A human health risk assessment (HHRA) conducted as part of the Remedial Investigation (RI) for the marsh crust and the former subtidal area materials concluded that at the depths the marsh crust is now located beneath FISCA, these materials do not pose a risk to human health. No chemicals of concern (COCs) were identified in the HHRA for the marsh crust, because no completed exposure pathways were deemed to exist. However, it was considered that an exposure pathway would exist for workers or residents if contaminated marsh crust materials were brought to the surface or disposed of in an uncontrolled manner.

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At Alameda Point, an exposure pathway was deemed to possibly exist by workers to the marsh crust and subtidal area materials during construction of building foundations and utility work at depths of 4 to 10 feet bgs. In addition, if these materials were brought to the surface or disposed of in an uncontrolled manner, workers or residents could be exposed.

The DON estimated risks for the future scenario of excavation and uncontrolled distribution of marsh crust materials on the surface. Risks were estimated by comparing benzo(a)pyrene (B(a)P) concentrations in the marsh crust materials with the USEPA Region 9 preliminary remediation goal (PRG) value for residential land use. B(a)P concentrations were used for the comparison because of the compound's potential toxicity. Based on these comparisons, excess lifetime cancer risks (ELCR) of 2×10^{-3} were estimated for individual marsh crust borehole samples at FISCA, and ELCR of 3×10^{-4} were estimated for individual marsh crust borehole samples at Alameda Point. These levels of risk were determined to be unacceptable for unrestricted use.

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Section 3 Site Background

Several ecological risk assessments (ERAs) were conducted to evaluate whether chemical compounds reported, in the marsh crust and former subtidal area materials underlying FISCA and at Alameda Point would potentially cause adverse ecological impacts to the environment. The terrestrial ERA found no potential risks to terrestrial receptors at FISCA because FISCA has (1) limited and unsuitable habitat, (2) no endangered species that feed or nest on the facility, (3) a scarcity of mammalian receptors, and (4) the marsh crust is encapsulated at some depth below the existing ground surface, with limited potential for adverse effects to terrestrial biota.

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Although wildlife habitats were known to be located at Alameda Point, excavation of the marsh crust and the former subtidal area materials in the future was not expected to create an ecological risk, because the marsh crust and former subtidal area are at depths that would prevent a completed exposure pathway for ecological receptors, and because development and construction would generally not be conducted in established habitats, but rather in areas already modified by human activity, such as port facilities, office buildings, and runways, which comprise most of Alameda Point.

On the basis of these considerations, and on the basis that the possibility that future construction could raise contaminated materials from the former subtidal area and marsh crust to the surface existed, response actions in the form of land use controls that would prevent potential future uncontrolled excavation and placement of marsh crust and former subtidal area materials on the surface where they may pose unacceptable risk to human health or the environment, was deemed to be necessary to protect the public health from actual or threatened releases of hazardous substances into the environment.

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Section 4 REMEDIAL ACTIONS

This section provides discussions of remedial action implementation history for the marsh crust and the former subtidal area materials. It presents relevant marsh crust and former subtidal area remedy selection related activities beginning with the signing of the RAP/ROD for the marsh crust and the former subtidal area materials to the present, and includes discussions of remedy selection and implementation, remedy performance, and the current status of the remedy.

4.1 SELECTED REMEDY

A HHRA conducted as part of the RI for the marsh crust and the former subtidal area materials concluded that at the depths the marsh crust is now located beneath FISCA, these materials do not pose a risk to human health. No COCs were identified in the HHRA for the marsh crust, because no completed exposure pathways were deemed to exist. However, it was considered that an exposure pathway would exist for workers or residents if contaminated marsh crust materials were brought to the surface or disposed of in an uncontrolled manner.

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At Alameda Point, an exposure pathway was deemed to possibly exist for workers exposed to the marsh crust and subtidal area materials during construction of building foundations and utility work at depths of 4 to 10 feet bgs. In addition, if these materials were brought to the surface or disposed of in an uncontrolled manner, workers or residents could be exposed.

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Excess lifetime cancer risks of 2×10^{-3} and 3×10^{-4} were estimated for marsh crust samples collected from beneath FISCA and Alameda Point, respectively. These levels of risk were determined not to be acceptable for unrestricted use of these properties.

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On the basis of these findings, it was concluded that hazardous substances were present in the marsh crust underlying FISCA, and in the marsh crust and former subtidal area materials underlying Alameda Point. However, these substances were considered to be low-level wastes because of their low concentrations and toxicity.

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In consideration of the possibility that future construction related activities could raise contaminated materials from the marsh crust and the former subtidal area to the surface, the remedial action objective (RAO) for the marsh crust and the former subtidal area materials was identified in the marsh crust and the former subtidal area RAP/ROD as preventing potential future uncontrolled excavation and placement of marsh crust and former subtidal area materials on the surface, where they may pose unacceptable risk to human health and the environment.

In accordance with these findings and conclusions, and, in accordance with the RAO, CERCLA requirements, BRAC program goals, and the future land use plans for the FISCA and Alameda Point properties (a mixed reuse of residential, commercial, and industrial), the DON and the DTSC, with the concurrence of the RWQCB, chose land use controls as the selected remedy for the marsh crust and former subtidal area materials underlying these properties.

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Section 4 Remedial Actions

As such, the selected remedy would prohibit excavation into the marsh crust and former subtidal area materials, unless proper precautions are first taken to protect worker health and safety and to ensure that excavated materials are disposed of properly. These land use restrictions consisting of excavation restrictions and permitting requirements would be implemented through a land use covenant between DTSC and the City of Alameda, Environmental Restrictions in Deed imposed by the DON, and the City of Alameda Marsh Crust Excavation Ordinance No. 2824 in a manner that would provide overall protection of human health and the environment.

4.2 REMEDY IMPLEMENTATION

No active engineering or construction would be required to implement this remedy. Roles and responsibilities for implementing and enforcing the land use controls remedy will be documented in a Land Use Control Remedial Design (LUC RD) to be prepared by the DON in FY 2006. The LUC RD will address the following elements:

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Descriptions of the marsh crust and former subtidal area materials.

A map showing the locations and the approximate size of FISCA and Alameda Point overlying these materials.

The land-use control objectives and restrictions stated in the RAP/ROD.

The specific legal mechanism that will be used to achieve the RAP/ROD'S land use control objectives and restrictions.

The required frequency and nature of periodic inspections of the areas overlying the marsh crust and former subtidal area materials.

Identification of the entities responsible for implementation of these monitoring and inspections.

Methods to be used to periodically certify compliance with the land use controls remedy upon completion of inspections, i.e., five-year reviews.

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Procedures for notifying the DON and signatories to the FFSRA in the event of a failure to comply with land use restrictions.

The following would be involved in implementing the selected remedy:

Environmental Restrictions in Deed. The DON has included Environmental Restrictions addressing marsh crust land use controls pursuant to California Civil Code Section 1471 in the deeds transferring title to FISCA and the former East Housing portion of the former NAS Alameda to the City of Alameda on July 17, 2000. The Environmental

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Section 4 Remedial Actions

Restrictions require that the City of Alameda and its transferees comply with City of Alameda Ordinance No. 2824 passed on February 15, 2000, when excavating below specified threshold depths or when excavating with DTSC approval if the Ordinance is repealed or DTSC determines that the Ordinance does not comply with the Covenant to Restrict Use of Property (discussed below). These Environmental Restrictions are to be interpreted in a manner that is consistent with and does not conflict with the Covenant to Restrict Use of Property between DTSC and the City of Alameda. These Environmental Restrictions (1) run with the land; (2) are for the benefit of, and enforceable by the DON; (3) are binding upon future owners and occupants of the property; and (4) shall be enforced by the DON when necessary and appropriate. The Deed provides that a failure to enforce the Environmental Restrictions in the Covenant between DTSC and the City of Alameda shall not preclude the DON from enforcing the equivalent Environmental Restrictions in the Deed. In the future, deeds transferring title to former DON properties included in the marsh crust and subtidal area of Alameda Point are to contain these environmental restrictions, as appropriate.

Covenant to Restrict Use of Property. On July 17, 2000, DTSC and the City of Alameda entered into a Covenant to Restrict Use of Property (Covenant) that includes Environmental Restrictions addressing marsh crust land use controls pursuant to California Civil Code Section 1471 and HSC Section 25355.5. The Environmental Restrictions prohibit excavation below specified threshold depths, except in compliance with the City of Alameda Ordinance No. 2824 passed on February 15, 2000 (see description below) or with DTSC approval if the Ordinance is repealed or DTSC determines that the Ordinance does not comply with the Covenant. The Covenant covers FISCA and the former NAS Alameda East Housing Area and contains Environmental Restrictions that (1) run with the land; (2) are for the benefit of, and enforceable by the DTSC; and (3) are binding upon future owners and occupants of the property. In the future, transfers of former DON properties included in the marsh crust and subtidal area of Alameda Point are to require a similar covenant.

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Marsh Crust Ordinance. The City of Alameda has enacted City of Alameda Ordinance No. 2824 passed on February 15, 2000 that prohibits engaging in any excavation below specified threshold depths on former DON property without an excavation permit and without taking proper measures to ensure that workers are not unduly exposed and that all contaminated material brought to the surface is properly disposed of (Figure 2). The City of Alameda is to directly implement and enforce the Ordinance. If the excavation Ordinance is repealed in the future, or if DTSC has made a written determination with 30 days prior written notice to the City of Alameda that the excavation ordinance does not comport with the intent of the DTSC/City of Alameda covenant, then a permitted excavation may be conducted only in accordance with written approval by DTSC. The permittee's application for such an approval would be submitted to DTSC and will comply with the permit application requirements of the last version of the excavation ordinance or such other requirements as DTSC may specify.

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Section 4 Remedial Actions

In summary, the land use controls selected as the remedy for the marsh crust and the former subtidal area materials is intended to restrict excavation into these materials without the required permits and without proper measures to dispose of excavated materials, excluding those areas requiring remediation of soil above the marsh crust and the subtidal area. The properties of FISCA and Alameda Point would thus be available for either residential or industrial, or both, use.

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This response action was intended to control risks potentially posed by excavations that could bring marsh crust and subtidal area materials to the surface, where they could remain as a source of exposure and could pose an unacceptable risk to human health or the environment. Under current conditions, the marsh crust and former subtidal area materials in their existing locations do not pose a risk to human health or the environment because of their depth and because they are overlain by areal fill. The selected remedy meets the RAO, except for completion of the Land Use Controls Implementation and Certification Plan (LUCICP), now the LUC RD, because land use controls would prevent exposure to marsh crust and former subtidal area materials that may pose a threat to human health by prohibiting excavation of these materials below a certain depth without an excavation permit. Also, the remedy requires that proper health and safety and disposal procedures be followed when handling excavated marsh crust and former subtidal area materials. Land use controls contain mechanisms and procedures which allow the DTSC to enforce them.

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Lease in Furtherance of Conveyance. On June 6, 2000, DON and the Alameda Reuse and Redevelopment Authority (ARRA) entered into a Lease in Furtherance of Conveyance (LIFOC) for Former Naval Air Station Alameda. The LIFOC addresses Economic Development Conveyance (EDC) parcels, Public Benefit Conveyance (PBC) parcels, federal (FED) parcels, and three non-EDC, -PBC, or -FED parcels. Potential digging restrictions subject to negotiation with the ARRA, institutional controls, and/or land use restrictions are placed on most of the parcels.

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Section 5
PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the first five-year review of the remedy selected and implemented for the marsh crust and former subtidal area materials underlying FISCA and Alameda Point,

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Section 5 Progress Since The Last Five-Year Review

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Section 6

FIVE-YEAR REVIEW PROCESS AND FINDINGS

This section discusses the five-year review process undertaken for the remedy implemented for the marsh crust and former subtidal materials underlying FISCA and Alameda Point, and presents its findings. This five-year review was conducted according to procedures described in DON's May 21, 2004 policy for conducting five-year reviews for DON sites, and in accordance with procedures described in EPA's June 2001 guidance for conducting five-year reviews of NPL or non-NPL sites.

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6.1 FIVE-YEAR REVIEW ADMINISTRATIVE COMPONENTS

The lead agency responsible for this five-year review was the DON. The CDM/Brown and Caldwell Team provided technical and community relations support to the DON.

During April and May 2005 the DON, CDM, and Brown and Caldwell established a team and schedule for the five-year review of the marsh crust and the former subtidal area materials remedy. The components of this five-year review included:

Community involvement;

Review of relevant documents, data, reports, and agreements related to the marsh crust and former subtidal area materials remedy;

Review of federal and state applicable or relevant and appropriate requirements (ARARs) cited in the marsh crust and former subtidal area RAP/ROD;

Site visits and inspection of FISCA and Alameda Point properties overlying marsh crust and former subtidal area materials;

Interviews with staff of the DON, DTSC, Catellus, City of Alameda, and the Restoration Advisory Board (RAB); and,

Preparation of this five-year review report.

The schedule for overall completion of this first five-year review for the remedy implemented for the marsh crust and former subtidal area materials extends through July 2006.

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6.2 COMMUNITY INVOLVEMENT

Community interest in the remedy implemented for the marsh crust and the former subtidal area materials has been extensive, as can be judged from the many comments received on this subject by the DON from the community during the preparation of the RAP/ROD for the marsh crust and the former subtidal area materials. At that time the community had expressed concern as to the enforceability of the remedy and identification of specific threshold depths for the marsh crust and the former subtidal area materials. The DON responded that it will be able to enforce the Environmental

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Section 6 Five-Year Review Process and Findings

Restrictions in Deed, and the City of Alameda and the DTSC will be responsible for enforcing the Covenant to Restrict Use of Property. Together with the third component of the remedy, Marsh Crust Excavation Ordinance No. 2824, these controls would provide three 'tiers' of protection to human health and the environment. The DON also responded that threshold depths would be calculated for each excavation project and will vary, depending on the location of the project.

Another concern expressed by the community was that additional investigations of the depth of the marsh crust and its thickness seemed to be warranted. The DON responded that the remedy selection decision for the marsh crust would not be significantly enhanced by additional data collection. The DON stated that protection of human health and the environment would be better served by implementation of the land use controls rather than by additional investigations, and added that in the event new information was discovered that would indicate that the land use controls are no longer protective (for example, through the 5-year review process), the remedy could be re-evaluated and upgraded.

The community expressed a concern as to the assessments related to the source of and risks from marsh crust contamination. The DON responded that after extensive study and analyses, it was confident that the source of the marsh crust contamination was historical deposition of effluent that contained PAHs and other industrial wastes released to marsh waters from the late 1800s until the 1920s. These wastes were apparently deposited in the marsh before the DON first occupied the area and before the wastes were entombed under sediment and other materials dredged from the Oakland Inner Harbor and San Francisco Bay.

A major goal of the DON's community relations program during the course of investigations and remedy selection process it has conducted for the marsh crust and the former subtidal area materials has been to keep the local community in Alameda informed of its activities. To that affect, it has met regularly with the RAB and the BCT and provided them with the progress being made on the project. In June 2000, the DON issued its Proposed Plan describing its preferred remedy for the marsh crust and the former subtidal area materials, and followed the Proposed Plan by issuing its RAP/ROD in February 2001 describing the selected remedy.

The DON will place public notices in the local Alameda newspapers announcing the preparation of this five-year review of the remedy implemented for the marsh crust and the former subtidal area materials. The DON will also prepare a fact sheet on this five-year review.

6.3 DOCUMENT AND DATA REVIEW

As part of this five-year review, Brown and Caldwell conducted reviews of numerous documents related to the remedy implemented for the marsh crust and the former subtidal area materials. These reviews focused primarily on documents that provided an insight into the technical and regulatory analyses and considerations which led to remedy

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Section 6 Five-Year Review Process and Findings

selection, and insight into the implementation of this remedy. These documents contained site-specific data which were also reviewed as part of this task.

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The RI and FS reports, as well as the RAP/ROD for marsh crust and former subtidal area materials provided data and information on the human health and ecological risk assessments conducted for the marsh crust and the former subtidal area materials, identified the RAOs as well as the ARARs for the marsh crust and the former subtidal area materials, described the selection process of the final remedy and the basis for that selection, and implementation of the remedy.

Numerous agreements made between the DON and the City of Alameda as well as the DTSC provided information on the regulatory oversight provided for this remedy selection process as well as an understanding of the land use restrictions placed on the future use of the properties overlying the marsh crust and the former subtidal area materials with respect to the human health concerns reported for exposure to the marsh crust and the former subtidal area materials if these materials were to be handled without adequate protection and controls. These include such documents as the Quitclaim Deed between the Navy and the City of Alameda, the covenant document between the City of Alameda and DTSC, the LIFO between the Navy and the ARRA, and the City of Alameda Ordinance 2824 (Marsh Crust Excavation Ordinance).

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Collectively, these documents and some others (in combination with personal interviews) provided information to this five-year review which allowed developing a chronology of events, and an understanding of the involvement of the regulators and the community in the remedial action selection and implementation process for the marsh crust and the former subtidal area materials.

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Attachment A provides a listing of relevant marsh crust and the former subtidal area materials related documents included in this five-year review. Data review is discussed in Section 7 of this five-year review report.

6.4 SITE VISIT AND INSPECTION

On May 10, 2005, representatives of the DON and Brown and Caldwell physically and visually inspected FISCA and Alameda Point properties overlying the marsh crust and the former subtidal area materials. A representative of Catellus Corporation joined the site inspection team for a portion of the FISCA inspection.

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Conditions during the site visit were favorable, with clear weather and no precipitation. Most of FISCA and Alameda Point were accessible to the site inspection team. The portion of Alameda Point which essentially comprised the aircraft landing strips was not entered due to existence of habitats of numerous bird species.

The purpose of this site inspection was to assess the protectiveness of the land use controls remedy implemented for the marsh crust and the former subtidal area materials.

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No significant issues had been identified following the implementation of the remedy for the marsh crust and former subtidal area materials and none were identified at this site

Section 6 Five-Year Review Process and Findings

inspection. Visual examination of the FISCA and Alameda Point properties did not reveal discernible signs of soil erosion or unexplained excavations into the marsh crust and former subtidal area materials. Construction activities by the redevelopment contractor Catellus were well underway within a site located on FISCA (Site IR02). Excavations for a storm water pumping station at this site had extended into the marsh crust materials. Catellus showed the permits it had obtained for that excavation, in compliance with LIFOC and Marsh Crust Ordinance requirements, and discussed its plans for characterizing the excavated materials that had been stockpiled on the site prior to their off-site disposal at regulated facilities. The site appeared to be well secured by fencing surrounding it; vehicular and pedestrian access into the site was further restricted by Catellus as part of its site control during its ongoing construction activities.

Land use controls that are in place for the marsh crust and the former subtidal area materials prohibit uncontrolled and non-permitted excavations of these materials. No activities were observed that would have violated these land use controls. An interview with DTSC, a visit to and interview at Alameda City Hall, and review of environmental restrictions placed on deeds of Bayport properties, formerly East Housing Area, confirmed that these land use controls are currently in effect.

Attachment B contains the site inspection form providing findings of FISCA and Alameda Point site inspections conducted on May 10, 2005. Attachment C contains photographs of these properties taken during the site inspection on May 10, 2005 as well as an aerial photograph of FISCA and Alameda Point taken in October 2004. Since there were no open excavations that allowed visual sightings of the marsh crust or former subtidal area materials at the time of this site inspection except for the pumping station excavation at Site IR02 (FISCA), photographing or developing visual descriptions of these materials were not obtainable or possible.

6.5 INTERVIEWS

Interviews were conducted with individuals representing various entities connected to the remedial action implemented for the marsh crust and the former subtidal area materials, as listed below.

Mr. Thomas Macchiarella, Alameda BRAC Environmental Coordinator,
BRAC Program Management Office West

Mr. Lou Ocampo, P.E., Remedial Project Manager, Department of the Navy

Mr. Doug DeLong, Environmental Compliance Manager, BRAC Program Management
Office West

Mr. Henry Wong, Remedial Project Manager, California Environmental Protection Agency,
Department of Toxic Substances Control

Mr. Philip Owen, Director of Construction, CATELLUS Commercial Development
Corporation

Ms. Debbie Potter, Base Reuse & Redevelopment Manager, City of Alameda

Peter Russell, Ph.D., P.E., Principal, Russell Resources, Inc., Consultant to the City of

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Section 6 Five-Year Review Process and Findings

Alameda

Mr. Gregory McFann, Chief, Planning and Building Department, City of Alameda

Mr. Ken Hansen, Community Co-Chair, Alameda Annex Restoration Advisory Board

An interview documentation form listing the name, title, and organization of each interviewee, along with the date and location where each interview took place, is provided in Attachment D. Individual interview records documenting each interview are contained in Attachment E.

No significant problems or concerns regarding the implementation of land use controls remedy for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point over the past five years were identified during the interviews. There had not been any emergency responses in connection with the remedy selected and implemented for these materials.

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Section 6 Five-Year Review Process and Findings

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Section 7 TECHNICAL ASSESSMENT

This section provides an assessment of the performance and effectiveness of the remedial action implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point in satisfying the RAP/ROD requirements for protection of human health and the environment. This assessment is based on document and data review, site inspection, interviews, and the evaluations provided further below.

Technical assessment component of this five-year review focuses on responses to the following three key questions:

Question A: Is the remedy functioning as intended by the decision documents?

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives, used at the time of remedy selection still valid?

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

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Responses to these questions are provided below.

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

Yes. The review of documents and data, site inspection, and interviews indicate that the remedy implemented for the marsh crust and the former subtidal area materials is functioning as intended by the decision documents (RAP/ROD). Land use controls are in place that restrict the excavation of these materials. Covenants and deed restrictions are in place that reinforce and monitor the implementation of the land use controls remedy. The final Site Management Plan (SMP) Update prepared by the DON for the FISCA and Alameda Point properties further confirms the implementation of this remedy. A separate SMP prepared by the redevelopment contractor Catellus Development Corporation for site redevelopment activities, which among many other tasks involves excavations into the marsh crust and the former subtidal area materials, is in place and guides the daily and long term activities of Catellus, which is on site, and knowledgeable of the presence of these materials and the requirements of the SMP as well as the presence and requirements of the covenants and land use controls placed on these materials. Catellus has excavated into the marsh crust materials at FISCA, and has obtained the required permits before doing so, as per the LIFOC and Marsh Crust Ordinance.

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Section 7 Technical Assessment

7.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES USED AT THE TIME OF REMEDY SELECTION STILL VALID?

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Yes. The assumptions made at the time of remedy selection are generally unchanged. The selected remedy for the marsh crust and the former subtidal area materials is in place. There have been no reported changes to this remedy that would affect its protectiveness. The future land use expectations at the FISCA and Alameda Point properties have not changed. No newly identified exposure pathways that would impact the effectiveness of this remedy have been reported.

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As part of the response to this question, the ARARs, and the assumptions concerning exposure pathways were evaluated, as discussed below.

Changes in ARARs

The ARARs identified in the marsh crust and former subtidal area RAP/ROD were reviewed, and listed in Attachment F. The listing includes the citation for the ARAR, a brief description of the regulated parameter, the reference for the latest regulation reviewed, and a brief conclusion as to whether any updates to the regulation were identified that could potentially affect the protection of human health and the environment.

No changes to the ARARs evaluated in the marsh crust and former subtidal area RAP/ROD were identified that could potentially affect the protectiveness of the remedy implemented for the marsh crust and former subtidal area materials for protection of human health and the environment. In addition, no new ARARs were identified. However, the DTSC has recently adopted regulations for the purpose of establishing a standard for implementation of land use controls remedies where chemicals of concern remain at a site in concentrations not suitable for unrestricted use of that site. Effective April 19, 2003, the DTSC has added Section 67391.1, Land Use Covenants Regulations, to Title 22, Division 4.5, Chapter 39 of California Code of Regulations (CCR), as provided in Attachment F.

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Although it does not appear that these post-RAP/ROD regulations include any 'new' substantive requirements that are necessary to protect human health and the environment and that were not already covered by the underlying statutory ARARs identified and described in the marsh crust and former subtidal area RAP/ROD, the DON has agreed to accept substantive provisions of these regulations as "relevant and appropriate" state ARARs.

Changes in Exposure Pathways, Toxicity, and Cleanup Levels.

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Risk assessments conducted for the marsh crust and the former subtidal area materials were reviewed. Risks have been estimated for the possibility of excavation and uncontrolled distribution of these materials in the future by comparing (B(a)P) concentrations in the marsh crust to its USEPA Region 9 PRG value for residential land

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Section 7 Technical Assessment

use scenario. B(a)P concentrations have been used because of the compound's potential toxicity. The level of risk has been determined to be unacceptable for unrestricted exposure to these materials. No COCs have been identified in the risk assessments for the marsh crust, because no completed exposure pathways have been shown to exist. However, an exposure pathway was deemed to exist in the event the marsh crust and subtidal area materials were brought to the surface or disposed of in an uncontrolled manner, and if workers in excavations that extended to the depths of these materials were exposed to them. Overall, these assumptions still appear to be current. No new information has been reported that would potentially affect the protectiveness of the land use controls remedy and accompanying covenants for the marsh crust and former subtidal area materials currently being implemented for protection of human health and the environment.

7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

No. This five-year review did not discover information that would call into question the protectiveness of the land use controls remedy being implemented for the marsh crust and the subtidal area materials.

7.4 TECHNICAL ASSESSMENT SUMMARY

Based on the findings of this five-year review, the land use controls remedy selected for the marsh crust and the former subtidal area materials has been implemented as intended by the decision documents (and Marsh Crust Ordinance and LIFOC), except for completion of the LUCICP. The Final RAP/ROD indicated that a LUCICP would be required to set forth the roles and responsibilities for implementing, monitoring, and enforcing the land use controls documented in the RAP/ROD. The DON agrees with long-term monitoring and oversight of the land use controls remedy. This will be accomplished through the preparation of a LUC RD, similar in content to a LUCICP. The LUC RD is scheduled to be prepared in FY, 2006, and will provide the means to ensure implementation and enforcement of land use restrictions established for the marsh crust and former subtidal area materials.

Physical changes to the FISCA and Alameda Point properties that could potentially affect the protectiveness of the selected remedy were not discovered. No changes to the ARARs used for this remedy were identified that could potentially affect the protectiveness of the remedy for human health and the environment. There have not been changes to the risk assessment methodology or its assumptions that would affect the protectiveness of the land use controls remedy implemented for these materials.

This five-year review did not discover information that would call into question the protectiveness of the land use controls remedy that has been implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties.

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Section 7 Technical Assessment

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Section 8 ISSUES, CONCLUSIONS, RECOMMENDATIONS

This five-year review did not discover issues relative to the performance of the land use controls remedy that has been implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties. Land use controls have been and currently are in effect, as per the decision documents (RAP/ROD), LIFOC, and Marsh Crust Ordinance, that would restrict the exposure of residents, workers and the environment to these materials. Conditions that could result in having potential adverse effects on the future protectiveness of this remedy were not observed in this five-year review. The Navy intends to prepare a LUC RD in FY 2006, which will provide the means to ensure implementation and enforcement of land use restrictions established for the marsh crust and former subtidal area materials.

FISCA and Alameda Point properties overlying the marsh crust and former subtidal materials are being redeveloped in accordance with decision documents and redevelopment plans under the oversight of regulatory agencies. As redevelopment progresses, increased construction activities involving excavations potentially extending to the depths where these materials can be encountered, could reasonably be expected. Further, increased land use by new residents and workers is also to be expected. Also, future investigations and assessments could provide additional information on the threshold depths of the marsh crust and the former subtidal area materials currently depicted in land use covenants.

On the basis of the findings of this five-year review, conducting further five-year reviews of the land use controls remedy that has been put into effect for the marsh crust and former subtidal area materials underlying FISCA and Alameda Point properties is indicated.

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Section 8 Issues, Conclusions, Recommendations

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Section 9 PROTECTIVENESS STATEMENT

The land use controls remedy implemented for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point properties currently provides the protectiveness of human health and the environment intended by the decision documents (RAP/ROD). Exposure of residents, workers and the environment to these materials have been restricted suitably by this remedy, addressing potential threats to human health and the environment possibly posed by these materials. Land use controls in effect, as per the decision documents, LIFOC, and Marsh Crust Ordinance, clearly identify the permitting requirements and restrictions related to excavations into the marsh crust and the former subtidal area materials. DON's SMP and the Catellus SMP for the redevelopment of these properties provide guidelines for excavations and construction activities in a manner protective of the health and safety of site workers, future site residents, nearby residents, and the environment. Technical or physical issues related to the marsh crust and the former subtidal area materials that would be likely to reverse the current conditions and the remedy implemented for these materials were not discovered in this five-year review.

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A LUC RD planned to be prepared by the DON in FY 2006 will develop protocols for the enforcement and monitoring of land use restrictions implemented for these materials underlying FISCA and Alameda Point.

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Section 9 Protectiveness Statement

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Section 10 NEXT FIVE-YEAR REVIEW

Land use controls are currently in effect for the marsh crust and the former subtidal area materials underlying FISCA and Alameda Point. As such, there needs to be a review of the protectiveness of this remedy within the next five years, or before July 2011.

The next five-year review of this land use controls remedy should include reviews of ARARs and risk assessments with respect to any changes to them that may have occurred during the five years from the five-year review presented herein, as well as redevelopment and land use history of FISCA and Alameda Point properties over the next five years. Permits requested and granted for excavations into the marsh crust and the former subtidal area materials should be reviewed, and site inspection as well as interviews should focus on if there have been violations of the land use covenants and restrictions. Deeds of properties overlying the marsh crust and former subtidal area materials should be reviewed with attention to whether environmental restrictions for these materials are being included on the property deeds.

The next five-year review should also assess whether new information on threshold depths have become available. If so, the threshold depth map of Marsh Crust Excavation Ordinance No. 2824 should be modified accordingly. The effectiveness and protectiveness of the existing land use controls remedy under actual long-term land use conditions that would be expected to have significantly increased over the next five years, ought to be reviewed.

~~Deleted: Unless the LUC RD report recommends otherwise, the next Statutory Five-Year Review of the land use controls remedy currently in effect for the marsh crust and the former subtidal area materials underlying Alameda Facility/Alameda Annex and Alameda Point would need to occur within the next five years, or before January 2011. ¶~~

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Section 10 Next Five-Year Review

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FIGURES

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